



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2013-0901; Special Conditions No. 25-536-SC]

Special Conditions: Airbus Model A350-900 Airplanes; Flight-Envelope Protection: High-Speed Limiting

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for Airbus Model A350-900 series airplanes. These airplanes will have a novel or unusual design feature associated with high speed limiting. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: Effective date: [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

FOR FURTHER INFORMATION CONTACT: Joe Jacobsen, FAA, Airplane and Flightcrew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98057-3356; telephone (425) 227-2011; facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION:

Background

On August 25, 2008, Airbus applied for a type certificate for their new Model A350-900 airplane. Later, Airbus requested, and the FAA approved, an extension to the application for FAA type certification to November 15, 2009. The Model A350-900 airplane has a conventional layout with twin wing-mounted Rolls-Royce Trent XWB engines. It features a twin-aisle, 9-abreast, economy-class layout, and accommodates side-by-side placement of LD-3 containers in the cargo compartment. The basic Model A350-900 airplane configuration accommodates 315 passengers in a standard two-class arrangement. The design cruise speed is Mach 0.85 with a maximum take-off weight of 602,000 lbs.

The longitudinal-control law design of the Airbus Model A350-900 airplane incorporates an overspeed protection system in the normal mode, which prevents the pilot from inadvertently or intentionally exceeding a speed approximately equivalent to V_{FC} or attaining V_{DF} . Current Title 14 Code of Federal Regulations (14 CFR) part 25 sections do not relate to a high-speed-limiting protection system that might preclude or modify flying-qualities assessments in the overspeed region. However, the requirements of § 25.253 (high-speed characteristics) and its related policy are applicable to the Model A350-900 airplane and are not affected by this special condition.

Type Certification Basis

Under 14 CFR 21.17, Airbus must show that the Model A350-900 airplane meets the applicable provisions of part 25, as amended by Amendments 25-1 through 25-129.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Airbus Model A350-900 airplane because of a novel or unusual design feature, special conditions are prescribed under § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Model A350-900 airplane must comply with the fuel-vent and exhaust-emission requirements of 14 CFR part 34, and the noise-certification requirements of 14 CFR part 36. The FAA must issue a finding of regulatory adequacy under section 611 of Public Law 92-574, the “Noise Control Act of 1972.”

The FAA issues special conditions, as defined in 14 CFR 11.19, under § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The Model A350-900 airplane incorporates the following novel or unusual design features: an overspeed protection system that prevents the pilot from inadvertently or intentionally exceeding a speed approximately equivalent to V_{FC} , or attaining V_{DF} .

At $V_{MO} + 10$ knots or $M_{MO} + 0.02$ knots, an automatic nose-up pitch is applied with phase advance in the event of high acceleration. The speed stabilizes at $V_D - 10\text{kts}/M_D - 0.02$ if the stick is full forward, or the speed will return below V_{MO}/M_{MO} if the stick is released.

Discussion

This special condition establishes requirements to ensure that operation of the high-speed-limiting protection system does not impede normal attainment of speeds up to the overspeed warning. Its main features are:

1. It protects the airplane against high-speed/high Mach-number flight conditions beyond V_{MO}/M_{MO} .
2. It does not interfere with flight at V_{MO}/M_{MO} , even in turbulent air.

3. It still provides load-factor limitation through the “pitch limiting” function described below.
4. It restores positive static stability beyond V_{MO}/M_{MO} .

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

Discussion of Comments

Notice of proposed special conditions No. 25-13-23-SC for the Airbus Model A350-900 airplane was published in the Federal Register on January 8, 2014 (79 FR 1336). An anonymous comment was received January 16, 2014. The commenter was concerned about high-level windshears, and the potential violation of Reduced Vertical Separation Minimums (RVSM) airspace restrictions that might accompany a nose-up input of a high-speed protection system. In addition, the commenter was concerned about system failures or malfunctions leading to unintended control consequences and the pilot’s ability to appropriately counteract those control anomalies.

The FAA would like to clarify that this special condition only addresses one aspect of high-speed limiting designs. Many other regulations, such as 14 CFR 25.1301 and 25.1309, address the proper intended function and failure scenarios of such a system. Therefore, the anonymous comment is beyond the scope of this special condition, and is already accounted for and considered in the basic regulatory-compliance process.

Applicability

As discussed above, these special conditions apply to Airbus Model A350-900 airplanes. Should Airbus apply later for a change to the type certificate to include another model

incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on Airbus Model A350-900 series airplanes. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type-certification basis for Airbus Model A350-900 series airplanes.

In addition to § 25.143, the following requirements apply: Operation of the high-speed limiter during all routine and descent-procedure flight must not impede normal attainment of speeds up to overspeed warning.

Issued in Renton, Washington, on August 15, 2014.

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[FR Doc. 2014-19822 Filed 08/20/2014 at 8:45 am; Publication Date: 08/21/2014]